

## A NEW SPECIES OF FOSSIL TURTLE FROM THE PLIOCENE OF OREGON, WITH NOTES ON OTHER FOSSIL *CLEMMYS* FROM WESTERN NORTH AMERICA

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The genus *Clemmys* has an interesting geographical distribution with species in southern Europe, southeast Asia, northeastern North America, and one species in western North America. In contrast to many Cenozoic reptile groups, there are a number of fossil forms known. It is the purpose of this paper to discuss new and previously described fossil *Clemmys* from the Pacific Coast of North America.

Most of the material referred to below comes from the collections of the Los Angeles County Museum, including the recently acquired California Institute of Technology collection (L.A.C.M. and C.I.T.) and the Museum of Paleontology of the University of California, Berkeley (U.C.M.P.) and was studied through the courtesy of Dr Theodore Downs and Dr. R. A. Stirton, respectively.

Hay (1908) lists the following species of fossil *Clemmys* from western North America: *C. morrisiæ* (Bridger Eocene), *C. saxea* (Upper Miocene Mascall beds of Oregon), and *C. hesperia* (Pliocene, Rattlesnake beds of Oregon). Several specimens of Pleistocene *Clemmys marmorata* have been recorded (Brattstrom, 1953a, 1953b, 1955, 1958). The oldest known member of the genus is *C. bockmani* from the Paleocene of Saskatchewan.

### *Clemmys owyheensis* new species

TYPE: L.A.C.M. (C.I.T.) no. 5123, an entoplastron.

TYPE LOCALITY AND HORIZON: C.I.T. Loc. 62, Owyhee, Hemphillian Pliocene, near Rome, Malheur County, Oregon. It was found along the east side of Dry Creek, a tributary of Crooked Creek.

DIAGNOSIS: The specimen is a large emydid turtle with the humeral-pectoral sulcus crossing the entoplastron, gular-humeral sulci forming an acute angle with the mid-line of 33 degrees or less. The entoplastron is curved posteriorly and laterally, but is tapered anterior-laterally with a prominent anterior knob.

DESCRIPTION OF TYPE: The type consists of an entoplastron 33.5 mm. long and 36.0 mm. wide (Plate 21) with the humeral-pectoral sulcus crossing it, and with the humeral-gular sulcus forming an angle of about 28 degrees with the mid-line (or the two sulci forming an acute angle of 65 degrees or less). The

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entoplastron is curved posteriorly and laterally; anterior-lateral edges are strongly tapered towards the mid-line, but turn anteriorly about 8-10 mm. from the anterior tip to form a large knob (12 mm. wide at its base). The knob is slightly pointed and has the forks of the gular sulci upon it. The intergular sulcus start about 3.5 mm. anterior of the gular sulcus fork on the right gular-humeral sulcus.

PARATYPES: Four bones, all of the plastron, are designated paratypes. They all come from the same locality as the type and include another entoplastron, L.A.C.M. (C.I.T.) no. 5127, Fig. 21; and three epiplastrons, L.A.C.M. (C.I.T.) no. 5124-5126. The entoplastron is the same general size and shape as the type (length and width respectively: 33.0 and 33.5 mm.). It is somewhat more worn than the type and chips have broken off its ventral surface. The anterior knob is wider than in the type (14 instead of 12 mm.) and the humeral-gular sulcus angle with the mid-line is 33 degrees. The intergular sulcus starts 5 mm. anterior of the gular sulci fork on the left gular-humeral sulcus.

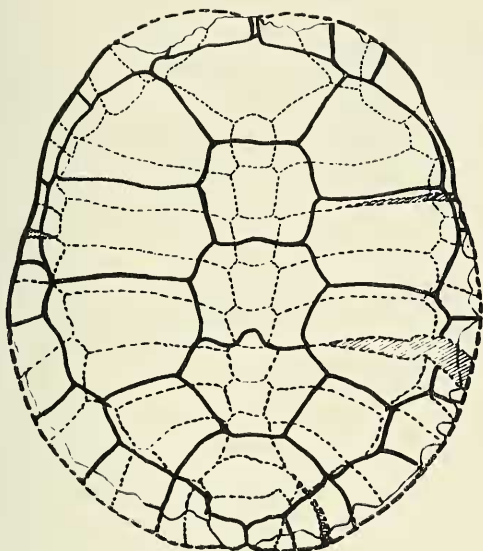
The left epiplastron (5126) is 51.0 mm. long (greatest length) and 30.0 mm. wide with a relatively strong gular-humeral sulcus. The right epiplastron (5124) apparently comes from another individual as it is 42 mm. long and 28 mm. wide. The third epiplastron (5125) is partly broken and worn. All three have a medial indentation for articulation with the knob of the entoplastron.

REFERRED MATERIAL: In addition to the type and paratypes, there are 14 marginal bones from the same locality and one marginal from another locality on Dry Creek. These marginals all appear emydine and are referred here to *Clemmys owyheensis*.

RELATIONSHIPS: *C. owyheensis* differs from all recent and fossil *Clemmys* in the shape of the entoplastron, especially as to its anterior knob and gular sulci angle. *C. owyheensis* appears more closely related to *C. morrisiæ* of the Bridger Eocene than to any other fossil or Recent *Clemmys*. It differs from "*hesperia*" and *morrisiæ* by being larger, having the anterior knob more developed, and having a smaller angle to the gular sulci. The Miocene *C. saxeæ* from the Mascall beds of Oregon is known only from a pygal bone and its relationship to *owyheensis* is unknown. Some of these relationships are diagrammed in Plate 22.

#### *Clemmys marmorata*

This living species is known from several Pleistocene localities, some of which are already recorded in the literature. Some fossil *Clemmys* from Pliocene deposits prove to be *C. marmorata*. *C. hesperia* described by Hay (1903), without comparison with



## PLATE 20

Dorsal view of carapace of fossil *Clemmys marmorata*, L.A.C.M. 3647, L.A. Brickyard locality no. 3, San Pedro Fm., Los Angeles Co., California. Pleistocene.

*marmorata*, falls within the variation shown by Recent *C. marmorata*. The material will be discussed by locality:

## PLEISTOCENE

*Rancho La Brea*, Los Angeles County, California, Late Pleistocene. Brattstrom (1953a, 1958) records *C. marmorata* from the La Brea Tar Pits.

*McKittrick Asphalt*, Kern County, California, Late Pleistocene. Recorded by Brattstrom (1953b).

*Carpinteria Asphalt*, Santa Barbara County, California, Late Pleistocene. Material from this deposit (including a record of *marmorata* from an archeological site in Santa Barbara County) is reported by Brattstrom (1955).

*Potter Creek Cave*, Shasta County, California, Late Pleistocene. Referred to by Brattstrom (1955).

*San Francisco Bay*, Irvingtonian Pleistocene. An emydid (U.C.M.P. no. 39062) recorded by Savage (1951) is probably *C. marmorata*.

*Tranquility*, Fresno County, California, Pleistocene. (SW $\frac{1}{4}$  of SE $\frac{1}{4}$  of NE $\frac{1}{4}$ , Sec. 29, T14S, R16E, Jameson Quad., 2 $\frac{3}{8}$  mi. S. by W. of Jameson and 2 $\frac{1}{8}$  mi. N. by E. of Tranquility). This

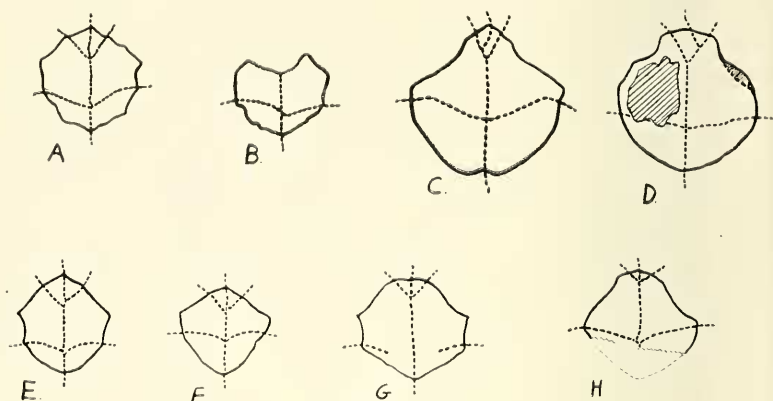


PLATE 21

Ventral views of entoplastra of *Clemmys marmorata* and *C. owyheensis* n. sp. A. *C. marmorata*, L.A.C.M. 3648, L.A. Brickyard, Pleistocene. B. *C. marmorata*, L.A.C.M. 3650, L.A. Brickyard, Pleistocene. C. *C. owyheensis* n. sp. Type: L.A.C.M. (C.I.T.) 5123. D. *C. owyheensis* n. sp. Paratype: L.A.C.M. (C.I.T.) 5127. E. and F. *C. marmorata*, Recent, Los Angeles Co., California. G. and H. "*C. hesperia*" (= *C. marmorata*), Redrawn from Hay.

sandy clay fossil deposit (U.C.M.P. Loc. 4401) contains fragments of *Clemmys* (no. 37705) which do not differ from recent *C. marmorata*.

*White Bluffs*, Washington, Early Pleistocene. C.I.T. Locality YE 36, Bluffs 1 mi. N. Werhl Ranch, opposite town of White Bluffs, Washington. From this locality there are 17 fragments of bones, mostly marginals, that are referred to *C. marmorata*.

*San Pedro Formation*, Los Angeles County, California, Pleistocene. C.I.T. locality 186, 100 ft. N.E. of corner of N. Pacific and Olive Sts., San Pedro, Los Angeles County, California. There is one left hypoplastron and inguinal buttress, one right epiplastron, and one costal of *C. marmorata* from this deposit.

U.C.M.P. locality 2407, Upper San Pedro Formation. Material from this locality includes one right hypoplastron and inguinal buttress, one right xiphiplastron, one right costal, two marginals, and fragments of a right hypoplastron. From the same locality are 1 *Pituophis catenifer*, 6 *Lampropeltis*, and 6 *Crotalis viridis* vertebrae in the University of California, Museum of Paleontology collections.

L.A.C.M. locality: L.A. Brickyard, locality no. 3, Mission Road and Daily Street, San Pedro, Los Angeles County, California. The following *Clemmys marmorata* material is found associated with *Equus*, camel, ground sloth, mastodon, and mammoth:

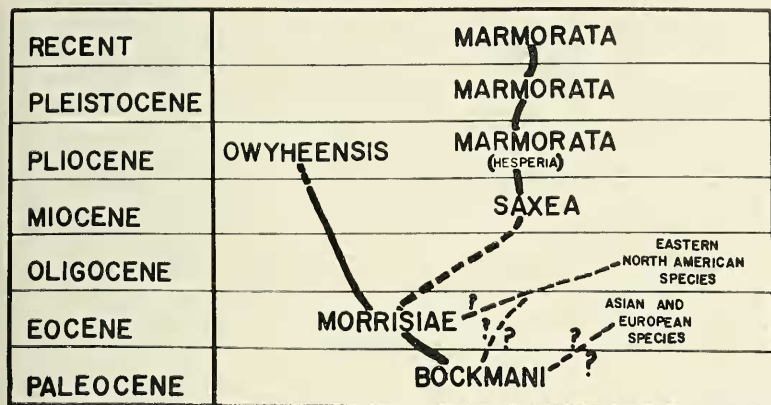


PLATE 22

Suggested relationships of the species of *Clemmys* of western North America.

A. One complete carapace (L.A.C.M. no. 3647), 13.6 cm. long and 11.9 cm. wide (Plate 20). The carapace appears to be similar to Recent *C. marmorata* except in minor details which may be attributed to individual variation, *i.e.* the small nodule which is found on the anterior portion of the forth central scute. Variation of this type may also be found in some Recent specimens of *C. marmorata*. The central line of the fossil carapace is depressed, probably the result of pressure during fossilization.

B. A right two-thirds of a second carapace (L.A.C.M. no. 3649) showing all but the last few posterior centrals. The estimated length of this carapace is 13.5 and 12.6 cm. respectively.

C. The left one-third of a third carapace (L.A.C.M. no. 3651) showing portions of the lateral scutes and their accompanying marginals.

D. An entire, though badly damaged shell (L.A.C.M. no. 3650) with the anterior and posterior portion of the plastron lost. The shell is distorted and fractured. A portion of the entoplastron is illustrated in Plate 21, figure B.

E. An anterior portion of a plastron (L.A.C.M. no. 3648), the entoplastron of which is illustrated in Figure 2a.

F. There are also six additional fragments (L.A.C.M. nos. 3652-3657) which are probably *C. marmorata*.

#### PLIOCENE

*Hungry Valley*, Los Angeles, California, Upper Pliocene. C.I.T. Locality 459, Hungry Valley Fm, SE $\frac{1}{4}$ , Sec. 21, T8N, R18W, Ft. Tejon Quad. There is a fragment of the anterior end of a carapace from this locality referable to *C. marmorata*. The



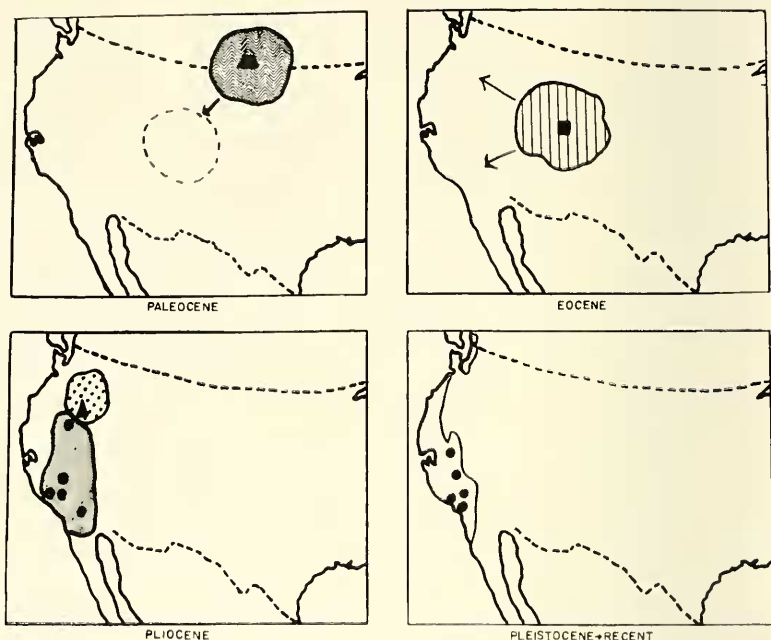


PLATE 23

Maps showing changes in distribution of the genus *Clemmys* in western North America.

precentral scute is 8.3 mm. long and 2.9 mm. wide; the first central scute is approximately 31.3 mm. wide and the length and width of the proneural bone is 29.0 and 38.8 mm. respectively.

*Mt. Eden*, L.A.C.M. locality 1118, Mt. Eden Fm., Riverside County, California. A pygal collected by T. Downs from this locality in 1953 does not differ from Recent *C. marmorata*.

*Ricardo Formation*, Kern County, California, Pliocene. A fragment of a turtle from U.C.M.P. locality 1083, no. 29280, is indistinguishable from *C. marmorata*.

*Oregon*: *C. hesperia*; Hay (1903) described *C. hesperia* from the Pliocene Rattlesnake beds of Rattlesnake Creek, Oregon on the basis of hyoplastral characters. We have found that these characters are not distinct (contrary to the remarks by Brattstrom, 1953a), but fall within the individual variation found in both Recent and Pleistocene *C. marmorata*. Further, we have found no basic difference between a reconstruction of the entoplastron of *C. hesperia* (a reconstruction made from the already reconstructed anterior plastron of *C. hesperia* by Hay, 1903)

and the entoplastron of Recent *Clemmys marmorata* (See Plate 21). *C. hesperia* must therefore be placed into the synonymy of *C. marmorata*.

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